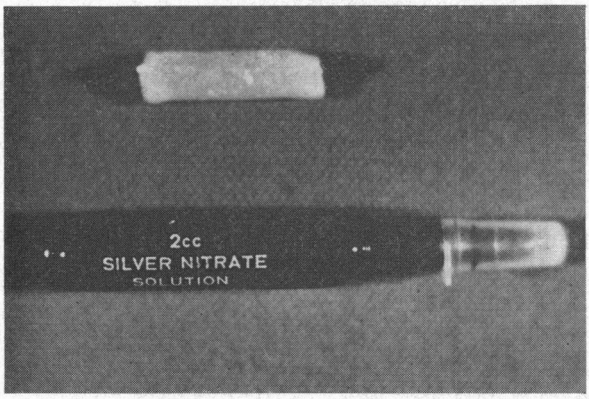


Figure 1.—Ampoules of 1 per cent silver nitrate (wax) and 35 per cent dental preparation (amber glass), showing total lack of similarity of appearance.

large quantities should be able to obtain similar low prices.

Centralized procurement, on a statewide scale, of silver nitrate solution has probably spared many California babies ocular damage. Should not familiarity with one packaging of the safe solution be insured by every means possible? Figure 1 shows containers that it would seem could not have been confused, but were. If the state does not continue this protection, is there not another organization with professional concern sufficient to assume this responsibility and modest expense? Direct dispensing from a central source to obstetrical services, by-passing the possibility of pharmacy error, might be a worthwhile added safety precaution.

## Summary

Two cases of permanent ocular damage due to accidental application of ammoniacal silver nitrate (25 to 35 per cent) in the newborn period are reported. The accidents illustrate a hazard deserving timely consideration, associated with the California State Department of Public Health's discontinuance of its practice of supplying silver nitrate solution in wax ampoules for lavage of newborn babies' eyes.

### REFERENCES

1. Barsam, Paul C.: Specific prophylaxis of gonorrheal opthalmia neonatorum: A review, New Engl. J. Med., 274:731-734, 31 March 1966.

2. Davidson, H. H., Hill, Justina H., and Eastman, N. J.: Penicillin in the prophylaxis of ophthalmia neonatorum, J.A.M.A., 145:1052-1055, 7 April 1951.

3. Dieckmann, William J.: The prophylaxis of gonorrheal ophthalmia neonatorum, Am. J. Obstet. & Gyn., 65:1155-1159, May 1953.

4. Harrison, William J.: Ocular Therapeutics, 2nd Ed., Charles C Thomas, Springfield, Illinois, 1953, pp. 62-63.

5. Lehrfeld, Louis: Prevention of blindness in the newborn, J.A.M.A., 143:1360, 12 August 1950.

6. Mathieu, Peter L. Jr.: Comparison study: Silver nitrate and oxytetracycline in newborn eyes, A.J.D.C., 95:609-611, June 1958.

7. State of California Department of Public Health, Family Health Bulletin, Vol. 9, No. 1, March 1966.

# Haemophilus Influenza Type b Orbital Cellulitis

DAVID A. MEDINA, M.D., AND RICHARD N. FINE, M.D., *Los Angeles*

IN CHILDREN, orbital cellulitis, an inflammation of the cellular tissues of the orbit, is usually an extension of bacterial infection of the paranasal sinuses.[5] *Streptococci*,[4] *Staphylococci* and *Escherichia coli*[6] have been implicated etiologically. Reports of only three cases of orbital cellulitis due to *Haemophilus influenzae* type b have appeared in the English language literature.[1,3]

During November and December 1965 three children with orbital cellulitis were admitted to the Childrens Hospital of Los Angeles. In each instance *H. influenzae* type b grew on culture of the blood. The purpose of this paper is to report these three cases and to compare them with the cases of other patients with orbital cellulitis admitted to the Childrens Hospital of Los Angeles during the five-year period 1960-1965.

## Reports of Cases

CASE 1.—An eight-month-old Mexican-American boy in whom the diagnosis of Sturge-Weber syndrome had been made was admitted to hospital four hours after swelling and tenderness developed in the right orbital area.

On admission the temperature was 40°C (104°F), the pulse rate 144 per minute, respirations 30 per minute and the blood pressure (Flush method) 100 mm of mercury. The right orbital area was massively swollen and purulent conjunctivitis was present. A hemangioma involved the right side of the face and neck. Except for generalized hypotonia no other abnormalities were noted on physical examination.

Childrens Hospital of Los Angeles and University of Southern California, Department of Pediatrics, School of Medicine.

Submitted 22 December 1966.

Reprint requests to: 4650 Sunset Boulevard, Los Angeles 90027 (Dr. Fine).

The hemoglobin content was 10.4 gm per 100 ml of blood. Leukocytes numbered 28,400 per cu mm. Bleeding and clotting times were within normal limits, as were results of urinalysis. The cerebrospinal fluid contained one red cell and three white cells per cu mm, and the sugar and protein content were 75 mg and 20 mg per 100 ml, respectively. *H. influenzae* type b was cultured from the right conjunctival exudate, from the nasopharnyx and from the blood. No organisms grew on a culture of the cerebrospinal fluid.

Paranasal sinus roentgenograms demonstrated soft tissue swelling around the right orbit, which obscured the maxillary sinus.

Initial therapy consisted of methicillin 400 mg and ampicillin 300 mg intravenously every six hours. The temperature returned to normal within 12 hours and methicillin was discontinued when the culture reports were obtained. Ampicillin was continued intravenously for 72 hours and then was given by mouth. Swelling, tenderness and redness subsided 72 hours after therapy was begun and the orbital cellulitis subsequently cleared.

CASE 2.—A three-year-old Caucasian boy was well until an upper respiratory infection, without cough or fever, developed two or three days before admission to hospital. On the day of admission fever and swelling of the right eye developed. At this time bilateral haziness of the maxillary sinuses was observed in roentgenograms of the paranasal sinuses. A diagnosis of periorbital cellulitis and sinusitis was made and he was admitted to the hospital.

On admission, the temperature was 38.3°C (100.7°F), the pulse rate 85 per minute and respirations 20 per minute. The right eyelids were swollen, warm and purple. Because of massive edema, the right eyelids were separated with difficulty. No other physical abnormalities were noted.

The hemoglobin content was 14.5 gm per 100 ml of blood and leukocytes numbered 27,000 per cu mm. The cerebrospinal fluid contained 46 red cells and one white cell per cu mm. Sugar content of the fluid was 75 mg and protein content 22 mg per 100 ml. No pathogens grew on a culture of cerebrospinal fluid. A blood culture grew *H. influenzae* type b; and *Neisseria catarrhalis, Micrococcus* and *Diplococcus pneumoniae* grew on culture of material from the nasopharynx. Culture of the right conjunctival exudate yielded coagulase negative *Staphylococcus aureus* and *alpha Streptococcus.*

Therapy consisted of intravenous infusion of methicillin, 400 mg and ampicillin 500 mg every six hours for 48 hours. Subsequently ampicillin was given orally. Fever abated within 12 hours, periorbital swelling decreased within 48 hours and the patient recovered.

CASE. 3.—The patient was a 19-month-old Caucasian boy in whom upper respiratory infection developed three days before he was admitted to hospital. On the day of admission the parents noted that he was irritable and that the right eyelids were swollen. At the time of admission the temperature was 39.2°C (102.6°F) the pulse rate 120 per minute and respirations 30 per minute. There was extensive edema, warmth and purplish erythema of the right eyelids, cheek and forehead. No other abnormalities were noted on physical examination. Bilateral haziness of the maxillary and ethmoid sinuses was observed on roentgenograms of the paranasal sinuses.

The hemoglobin content was 6.8 gm per 100 ml of blood. Microcytic and hypochromic red blood cells were noted on a smear of blood, and leukocytes numbered 20,800 per cu mm. Results of urinalysis were within normal limits. The cerebrospinal fluid contained eight red cells and one white cell per cu mm, and the sugar and protein contents were 80 mg and 21 mg per 100 ml, respectively. Culture of the cerebrospinal fluid yielded no growth. *H. influenzae* type b grew on cultures of the blood and of material from the nasopharynx, and cultures of exudate from the right eye grew *Klebsiella aerobacter* species, *Micrococcus, gamma Enterococcus* and *Diplococcus pneumoniae.*

The patient was treated at first by administration of aqueous penicillin 2,000,000 units and methicillin 500 mg every six hours intravenously. After 12 hours, intravenous administration of chloramphenicol 275 mg every six hours was added to this schedule.

The patient became afebrile 36 hours after admission. By 48 hours the periorbital swelling had subsided and the erythematous areas had become darker in color. Methicillin was discontinued on the third hospital day and on the fifth day penicillin and chloramphenicol were given by mouth instead of intravenously. An iron-containing preparation was given for iron deficiency anemia (Ferinsol®, 1.2 ml three times a day). The right periorbital edema had subsided by the seventh day and only the purple discoloration remained. The patient subsequently made a full recovery.

TABLE 1.— *Data on Infecting Organisms Related to Age of Patients in 16 Cases of Orbital Cellulitis, Childrens Hospital, Los Angeles, 1960-1965*

| Organism | Material Cultured: Nasopharyngeal or Eye Exudate | Material Cultured: Blood | Age of Patients |
|---|---|---|---|
| *Haemophilus influenzae* type b | 7 | 4 | 8 months to 36 months |
| *Staphylococcus aureus* coagulase positive | 5 | 0 | 22 months to 7 Years |
| *Micrococcus* | 4 | 0 | 40 months to 8 Years |

## Discussion

Orbital cellulitis due to *H. influenzae* type b occurs infrequently in children. Of the 16 patients with orbital cellulitis (Table 1) admitted to the Childrens Hospital of Los Angeles from 1960 to 1965, seven were infected with *H. influenzae* type b; five with coagulase-positive *Staphylococcus aureus* and four with *Micrococcus*. In four of the seven cases associated with *H. influenzae* type b, blood cultures were positive for that organism. In the three other cases (in which blood cultures were not obtained) *H. influenzae* type b grew on culture of material from the eye or nasopharynx.

The seven patients with *H. influenzae* type b cellulitis were between eight months and 36 months of age. In other reports[2] most infections due to *H. influenzae* type b were found in infants and children between the ages of two months and 36 months.

The onset of illness was acute in the *H. influenzae* type b group. All patients were in good health until two or three days before entering the hospital. In most cases, illness began with an upper respiratory infection. The sudden onset of pain and swelling of the orbital area which characterizes *H. influenzae* type b cellulitis may help to distinguish it from cellulitis caused by other organisms. Only two of the nine patients with orbital cellulitis of other cause had sudden onset of symptoms.

The characteristic purple discoloration of *H. influenzae* type b cellulitis as described by other observers[1] was noted in four of the cases reported here. However, it was not always present when the patient was first examined. Involvement of the maxillary or the ethmoid sinuses, or of both, was observed in roentgenograms of four of the seven patients with *H. influenzae* type b.

Early in the period covered by this report, patients with *H. influenzae* type b cellulitis were effectively treated with penicillin in combination with streptomycin, sulfonamides or chloramphenicol. In two of the three cases reported here, treatment was begun with ampicillin and methicillin, with good results.

In seven of ten cases of orbital cellulitis noted in children eight months to 36 months of age, the condition was ascribed to infection with *H. influenzae* type b. Hence, for orbital cellulitis in this age group, therapy in the beginning should be directed against this organism.

## Summary

Of 16 cases of orbital cellulitis observed at Childrens Hospital of Los Angeles in a period of five years, seven were caused by *H. influenzae* type b and the patients were children less than three years of age. In light of this incidence, it is believed that until the specific etiologic organism is identified, therapy for orbital cellulitis in children less than three years of age should include an antibiotic effective against *H. influenzae* type b.

### REFERENCES

1. Feingold, M., and Gellis, S. S.: Cellulitis due to Haemophilus influenzae type b, New Engl. J. Med., 272: 788, 1965.

2. Fothergill, L. D., and Wright, J.: Influenzal meningitis: The relation of age incidence to the bactericidal power of blood against the causal organism, J. Immunology, 24:273, 1933.

3. Green, M., and Fousek, M. D.: Haemophilus influenzae type b cellulitis, Pediatrics, 19:80, 1957.

4. Holt, L. B.: Retrobulbar neuritis and orbital cellulitis, J. Bowman Gray Sch. Med., 3:157, 1945.

5. Nelson, W. E.: Textbook of Pediatrics, W. B. Saunders Company, Philadelphia, 1964, p. 1491.

6. Shirkey, H. C.: Pediatric Therapy, C. V. Mosby Company, St. Louis, 1966, p. 822.